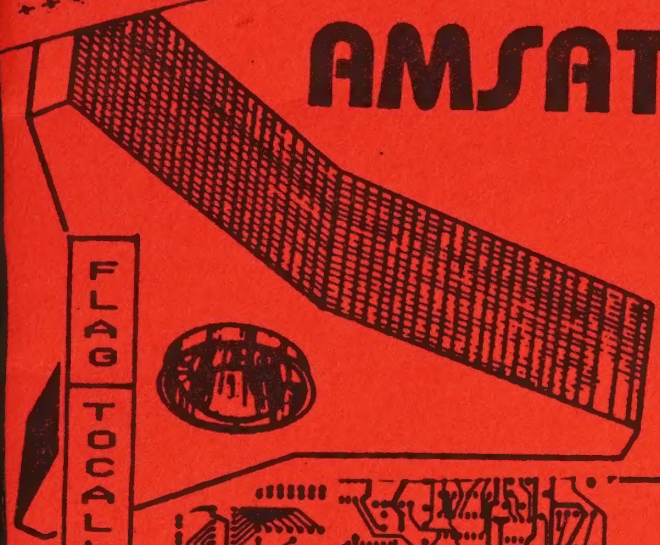
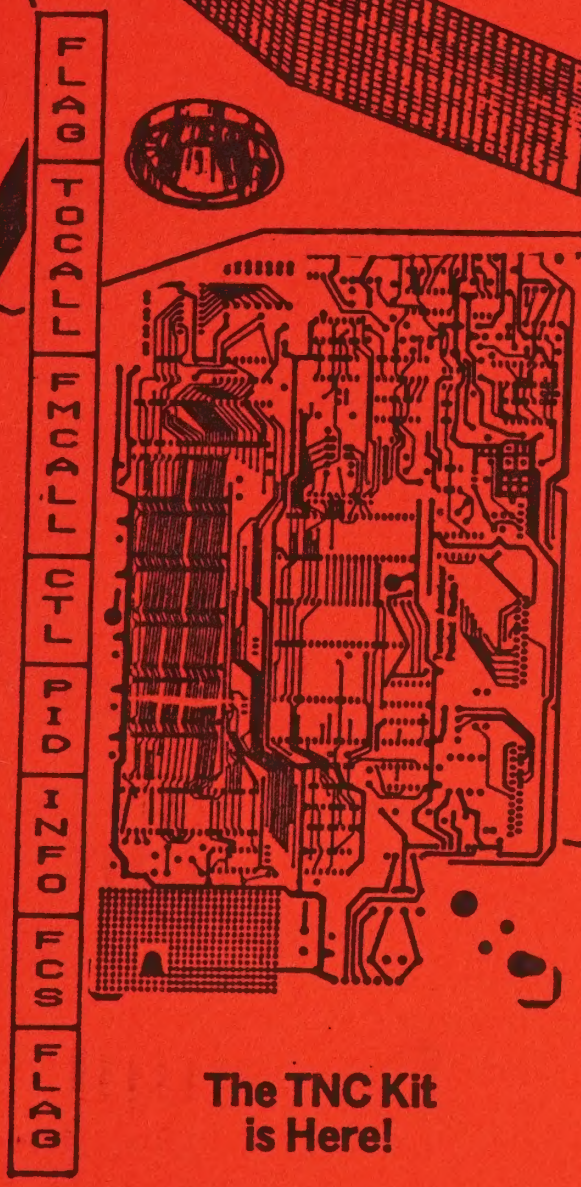
VOLUME 2, NUMBER 6
NOVEMBER/DECEMBER, 1983

**********inside**********
SLAPR BOARD II MANUAL
GROUNDSTATION USERS' GUIDE
**********this issue**********

# Phase III AMSAT

SLAPR PROTOCOL
VOLUME 2, NUMBER 3
MAY/JUNE, 1983






cmd:CONNECT WØJZT

S.L.A.P.R. Bulletin Board vers 1.0

Welcome to the SLAPR bulletin board system.
The system operator is Bill - WØJZT

The next SLAPR meeting will be held on Monday
March 28, 1983 at the Deaconess Hospital.
The meeting will begin at 7:30 pm.

checking your file...
Logging N/PVT to disk...

Active 0 of msgs 12.
You are caller # 30.
Next msg # will be 14.

Please retrieve and kill the following messages left for you:
3 8 9 11

Function(B,E,H,K,L,R,S,U,C,G,P,X,? for '?' if not known)?

S.L.A.P.R. BULLETIN BOARD

IS ON THE AIR

**The TNC Kit is Here!**

**SLAPR**
St. Louis Area
Packet Radio Club

ANNEE MONDIALE DES COMMUNICATIONS
WORLD COMMUNICATIONS YEAR
AÑO MUNDIAL DE LAS COMUNICACIONES
1983

SLAPR PROTOCOL
NEWSLETTER OF THE
ST. LOUIS AREA PACKET RADIO CLUB

## CONTROL

identifies the purpose of the packet

Here is a story by an unknown author and about four people named EVERYBODY, SOMEBODY, ANYBODY, and NOBODY.

There was an important job to be done and Everybody was asked to do it. Everybody was sure that Somebody would do it. Anybody could have done it, but Nobody did it.

Somebody got angry about that because it was Everybody's job. Everybody thought that Anybody could do it, but Nobody realized that Everybody blamed Somebody when Nobody accused Anybody.

And the conclusion? If Everybody will get into the act, and pitch in, then Nobody will need to blame Anybody because Somebody will have done the job that needs to be done by Everybody.

Folks, that is where we are at the present time with the editorship of SLAPR PROTOCOL. As I indicated in last month's CONTROL, family and work pressures have forced me to discontinue as the editor. (The tardiness of this issue is evidence enough.) I wish it were otherwise but it is not. So I take this opportunity to say thanks to all of the persons who have contributed to SLAPR PROTOCOL, knowingly and unknowingly. I think that it has served as a very valuable tool when there was little information available. If it has done that for you the reader then I will be satisfied as an editor. You will recall that I said that I would try to make each issue a little better than the last. I believe that we have been able to manage that. I hope that you will find this last issue the best.

To those of you, 67 to be exact, who, during the

continued on page 10

# BETA BITS

## Version Beta 3.0 Software Release

14 November 1983

Software release 3.0 for Beta TNCs is now available from TAPR. This release incorporates all protocol and user interface upgrades implemented in the TAPR 3.0 software released with the new kits. All software functions of the full version 3.0 release are implemented in the 24k (3 EPROM) memory except the onboard Debug facility and the EPROM Programmer support. This release requires only two minor hardware modifications to your Beta TNC.

Release 3.0 for Beta TNCs requires within a few bytes of the 24k bytes of EPROM available. The entire 6k bytes of RAM are utilized. All of the 32 bytes of NOVRAM have been used. Since it is extremely unlikely that any future software upgrades can be modified for memory compatibility with Beta TNCs, you are encouraged to upgrade your TNC to the level of the new kits. An upgrade kit and instructions will soon be available from TAPR. Recommended modifications also include improvements to the modem and power supply, as well as an optional modification to permit Morse Code ID to be send by FSK.

### Protocol Upgrades

Up to 8 intermediate digipeaters may now be included in the address field for long-distance operation. This modification is incompatible with older Beta software versions. If more than 3 digipeaters appear in the address field of TNCs in the area, TNCs running older Beta software may function incorrectly.

Up to 10 stations may be included in the Monitor TO and FROM lists. If the station you are connected to is included in the Monitor list, packets from that station are now displayed only once.

A connect request to a station already connected, or to a station with CONOK OFF will cause a special reply packet to be sent. Messages will be displayed at both stations, indicating "connect request" to the busy station and "station busy" to the requesting station. These messages are suppressed in Transparent Mode.

The complete address in re-connect packets is examined and changed if necessary. This allows one station to change the digipeat route if a retry-count disconnect occurs leaving the other station "connected".

The automatic Morse Code ID can now be disabled, although an ID can still be performed on command at any time. An optional ID string can be defined with up to 128 characters, including several popular prosigns such as SK and BT. If the automatic ID is enabled, an ID will be sent after a disconnect operation in addition to the 9-1/2 minute interval IDs.

A full duplex mode is provided for OSCAR 10 and other full-duplex radio operations. In this mode, the demodulator carrier-detect input is ignored and packets are acknowledged individually, allowing for increased throughput on OSCAR 10 communications.

The Poll/Final bit is now handled in a fashion which is compatible with the AX.25 specification.

A special feature allows line-feed characters to be added after carriage-returns in outgoing packets (in contrast to the AUTOLF feature which affects local terminal display). This feature permits compatibility with software implementations on VADCG TNCs.

The operation of CR has been changed slightly. It now causes the SENDPAC character to be included in the packet. Previously the character was replaced by a carriage-return in the packet.

THe packet-timeout interval range (PACTIME) in transparent mode has been changed. This interval now ranges from 1/4 second to 3-3/4 second rather than 1 second to 15 seconds.

Inconsistent implementation of the retry count has been improved. A problem with response to demodulator carrier-detect which affected full duplex stations has been fixed.

Beacon packets are sent to the address BEACON, using the digipeater list specified by the UNPROTO command.

User Interface Upgrades

An autobaud function has been added which will match terminal input at 110, 300, 1200, 4800, and 9600 baud. The value of ABAUD is automatically changed by this routine, which is entered whenever the default parameters are selected.

Null paoding for slow terminals has been changed. Nulls (ASCII code 0 characters) are no longer actually sent, but transmission is delayed for the specified number of character periods. Nulls can now be "sent" after carriage-returns, line-feeds, or both.

Status messages have been added to the parallel-port pins. These include link status, operating mode (Command Mode or data mode), and radio-link activity (carrier-detect status and outgoing message status).

An automatic RAM checkout has been added to the sign-on procedure.

The commands MONCON, MONALL, MONTO, and MONFROM have been changed to MCON, MALL, MTO, and MFROM. This permits shorter abbreviations for these commands. The Monitor Mode flags, MONITOR, MCON, and MALL are saved in NOVRAM, as are MTO/MFROM ALL/NONE. Specific monitor lists are not saved.

BEACON EVERY/AFTER and the beacon interval are now saved in NOVRAM.

A redisplay line character, <ctl-R>, has been added to the special character list. This command retypes on the terminal any partly complete input line. If a packet has been received but not displayed because FLOW ON is set, the packet will be displayed before the input line is redisplayed.

Both terminal and radio-link baud rates (ABAUD and HBAUD) are now displayed as numbers, e.g., 1200, rather than lookup table codes.

Subcommands have been added to DISPLAY which allow you to show groups of related parameters. The largest of these groups consists of 22 parameters, which allows easy viewing on a video terminal.

The display response to a <delete> character has been changed. If BKONDEL is ON, the response is backspace-space-backspace, rather than a single backspace.

The automatic entry to Converse or Transparent Mode after a successful connect is delayed until the user completes any partially entered command.

A new prompt is issued in Command Mode following line-cancellation and link-status messages. This produces better alignment of the error pointers produced by the parser. An empty command line (just a carriage-return) no longer produces an error message.

## Implementation

Implementation of version 3.0 software for Beta TNCs requires two hardware modifications. Neither modification requires great skill.

First, the line from the 6522 PA1 (pin 3) to Switch 2 must be cut. This line is on the top surface of the board. To cut the line without affecting the cosmetic appearance of the board, you may carefully remove the 6522 from its socket and cut the trace as it runs under the chip. You should carefully remove about a 1/4" section of the trace to insure a true "open". Failure to make this modification may result in damage to the 6522, as this line has been changed from an input to an output. Powering up the board with Switch 2 in the wrong position may result in damaging output contention.

Second, the 1933 MISCIN* pin (pin 24) must be tied to +5 volts. We recommend that you do this by connecting a 10k ohm resistor between this pin and +5 volts on the bottom of the board. Failure to make this modification will result in the modulator tone frequently being turned off during data transmission.

To obtain a copy of version 3.0 Beta software, please send your old proms, carefully packaged to protect against static discharge or mechanical damage, to TAPR with sufficient money to cover return postage and handling. If you prefer to purchase new proms, they are available for $30 per set including shipping (within the United States). We will ship your reprogrammed proms withing one week (3 days if you send erased proms). Copies of the TAPR kit manual, approximately 240 pages in length (without notebook cover) are available for $15. A copy of Chapter IV, Commands and Messages, of this manual is available for $3 to owners of Beta TNCs.

## BETA BITS

LYLE, DAN AND PETE:

I TOOK A BIT ERROR RATE CURVE OF THE NEW TNC TODAY. ITS SENSITIVITY IS EQUIVALENT TO THE OLD BETA BOARD AND FOLLOWS THE SAME BER CURVE WHEN TESTED WITH THE SAME FM SYSTEM AS THE OLD BETA BOARD. . I ALSO TESTED THE DYNAMIC RANGE OF THE NEW BOARD. IT HAS A DYNAMIC RANGE OF 51 DB. FROM -20 TO +31 DB FROM THE OLD BETA BOARD OPTIMUM INPUT THE NEW BOARD HAS THE SAME BER. THE LEDS BEGIN TO LIGHT AT ABOUT +22 DB GIVING A 9 DB RANGE WERE THE LEDS CAN BE ON WITH NO DEGRADATION IN SYSTEM SENSITIVITY. THE UPPER LIMIT OF DYNAMIC RANGE IS WHEN THE MF-10 GOES INTO LIMIT. THIS CAN BE SEEN ON A SCOPE SO IF YOU WATCH THE INPUT TO THE 2211 AND IT IS OUT OF CLIP AND THE TNC IS PRINTING SOMETHING THEN YOU ARE WITHIN THE OPTIMUM SETTING FOR THE NEW BOARD.

I ALSO RE-TESTED THE EFFECT OF ALLOWING THE TRANSMITTER TO GO INTO CLIP. AGAIN THE CLIPPING ACTION OF THE TRANSMITTER AUDIO CURCUITS DEGRADES SYSTEM SENSITIVITY SO BOTH THE TRANSMITTER AND RECEIVER SHOULD STILL BE KEPT OUT OF CLIP. I ALSO TESTED THE EFFECT OF DE-EMPHASISING BEFORE MODULATION. THIS DEGRADED PERFORMANCE WITH THE NEW TNC. I ALSO REMOVED THE MF-10 AND PRE-EMPHASISED THE RECEIVER OUTPUT (THIS IS THE SUGGESTED SYSTEM FROM GLB). THIS SYSTEM PERFORMED ABOUT 1.5 DB WORSE. REMOVING THE MF-10 WITH NO PRESHAPING OF THE TRANSMIT AUDIO DEGRADED SYSTEM PERFORMANCE BY ABOUT 2 DB. THEREFORE, THE OPTIMUM SYSTEM STILL SEEMS TO BE KEEPING THE TRANSMITTER AND RECEIVER OUT OF CLIP AND CONTRARY TO GLB'S STATEMENTS, THE MF-10 DOES PRODUCE ABOUT A 2 DB IMPROVEMENT IN SYSTEM PERFORMANCE. I HOPE TO DO SOME TESTS USING GAUSSIAN NOISE INSTEAD OF THE FM NOISE TO CHECK THE REPORTED DIFFERENCE BETWEEN THE BETA BOARD AND THE NEW BOARD. AS I SAID LAST NIGHT, THE DIFFERENCE MAY BE DUE TO THE FACT THAT YOU ARE NOW PRE-EMPHASISING THE RECEIVER AUDIO BEFORE THE MF-10 AND A FLAT GAUSSIAN CHANNEL MAYNOT LIKE THAT.

73 FOR NOW

STEVE GOODE, K[illegible]NG

PROTOCOL

level 3 considerations

# Data Communications

QEX

Conducted by
David W. Borden,* K8MMO

QEX July 1983

## Level-3 Considerations

This month, we are all thinking about true networking. What we have now is not a network, but rather is about 250 separate nodes that can packet to each other if a medium exists. Possibly AMSAT OSCAR 10 will give us a real good medium to use. A network of terrestial nodes however is another goal. That requires that we think about new issues.

First, using the simple approach, what are the problems? Assume that K8MMO, Dave is in Washington DC and KA6M, Hank is in San Francisco. How do I talk to Hank? I am in an area of about a dozen packeteers in rf range of each other. Hank has about 40 packeteers in range of him. How do I connect up with Hank. Specifically:

a. How do I know where Hank is? Actually, today he may not be in San Francisco, he may be in Los Angeles. We can simplify things by assuming that if he is away, a mailbox system on the San Francisco local area network will accept traffic for later pickup by Hank.

b. Do I establish virtual circuits all across the country to Hank? Example, Washington-Kansas City and Kansas City-San Francisco?

c. Assume that some extra software is required for this networking, where is it? In the Terminal Node Controller or in some smarter (larger memory) computer?

d. Do I allow implicit route selection (the computer network controllers choose the route) or explicit route selection (the users choose the route)?

e. What happens when a node goes down in the middle of a connection? How do we recover?

To begin work on the standard we must first review the layers:

Level 1, or the physical control layer of the ISO (International Organization for Standardization) model is: "the mechanical, electrical, functional and procedural characteristics to activate, maintain and deactivate the physical link between the DTE and the DCE." Paul Rinaldo, W4RI has drafted an AX.25 Level 1 definition which has been circulated for comment. A revision is to be prepared in the near future.

Level 2, or the link control layer of the ISO model is: "the physical link control procedure" which specifies the headers and trailers of blocks of data sent. Higher-level data link control (HDLC) is the line-control procedure used by AX.25 as various hardware chips implement it (Intel 8273, Western Digital 1933, Zilog 8530, SIO). The latest description of AX.25 level 2 in a paper by Terry Fox, WB4JFI, was presented at the "Second ARRL Amateur Radio Computer Networking Conference," proceedings of which are available from ARRL Hq for $9.00 post paid.

Level 3, or the network control of the ISO model is: "the virtual circuits, logical circuits or logical links" that connect network nodes. Currently VADCG and TAPR TNC software implements a connection and disconnection between two nodes. Amateur Radio call signs are used to identify the nodes. The AX.25 protocol is the defacto standard that defines how to create and accept the required data and control packets. We have chosen to divide Level 3 into two sub-layers, the local network sub-layer, which is directly above the link level. This sub-layer is what is already coded and working AX.25 in both TAPR and VADCG TNC boards. Directly above the local network sub-layer is the internetwork sub-layer and that is what needs definition and code.

Layer 4 of the ISO model, the transport layer, may or may not be required and will not be discussed here.

In the study of Level 3, the internetwork sub-layer, we have chosen to implement a connection type network (vice datagrams) and will follow the CCITT (International Telegraph and Telephone Consultative Committee) X.25 Level 3 protocol having to do with virtual circuits. Thus, we have narrowed the field a little, but much work needs to be done.

Eric Scace, K3NA, has been involved deeply in X.25 and is advising us on what X.25 is all about. One cannot deduce everything about X.25 by reading the CCITT documents. A guide is required, and Eric is our translator. He tells us what they meant when they wrote whatever part of the protocol that we are looking at. Eric has identified the following points of discussion that require decision concerning Level 3, X.25:

a. Logical channel numbers are used in each active virtual circuit. How should the range of LCNs be handled?

b. Should we employ diagnostic packets?

c. Are abbreviated or other forms of the address field allowed? Currently the address fields employ amateur call signs and device identifiers. AX.25 address procedures require a separate appendix.

d. The terms DTE and DCE as they pertain to AX.25 use must be clearly defined.

e. The set of packet sequence numbers allowed to cross the DTE-DCE interface is called the window. Should we force the window size to two and keep it simple?

f. Study of the 63 octet (byte) facility field is required for route selection information.

g. Should internetworking with public data nets be allowed? If so, how about third party agreement enforcement? What about restrictions against business use?

h. Should hunt groups be allowed for reaching an authorized control point without caring which one? How does all this relate to group addressing?

We shall be studying all these questions and more and producing a draft standard for packeteers to examine. - K8MMO.

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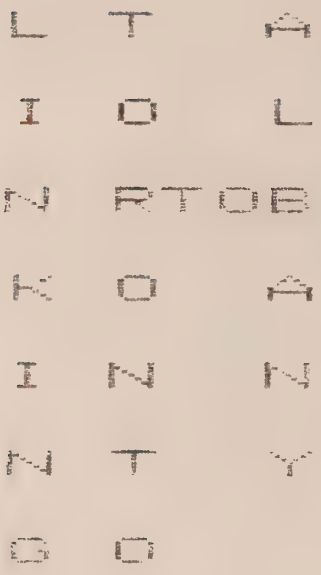
.CONTROL continued from page 2

last eight weeks, have asked to be placed on our list, I say I am sorry that SLAPR has decided to discontinue the publication of SLAPR PROTOCOL.

I would personally endorse your joining TAPR and requesting, no pressuring TAPR, to seriously consider turning PSR into a national packet radio MAGAZINE. It is time that PACKET RADIO has its own specialized rag with solid, serious and pace-setting articles as well as a continual flow of beginners information to feed the ranks of new enthusiasists.

As for this Nobody, I will give what time I am able to give through keeping the NEWS and NETS features of SLAPR BOARD II up to date on several special interests. I will miss the direct contact with other groups through the exchange of newsletters. Thanks to all of the hard working editors that put them together and who have been willing to share them with SLAPR. Let me assure you, if I continue to reveive them, I will use them in maintaining SLAPR BOARD II for the local packeteers.

73 to all and to all a good night. Gus, W9OFZ



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## REPEATER LINKING PROJECT

By Doug Lockhart, VE7APU

During the Rochester Hamfest this summer a number of interested packet radio enthusiasts in the upstate New York and the Toronto-Hamilton area discussed the possibility and practicality of setting up a chain of interlinked digital repeaters extending from Toronto, Ontario to Albany, New York which would eventually allow linking into another proposed digital repeater chain running up and down the east coast of the U.S.' At the time there was only one digital repeater operating in the entire area and the project presented a lot of difficulties. In spite of some obviously apparent problems there was a lot of interest expressed in proceeding with the idea.

A couple of weeks after the Hamfest, I took a trip along the route of the proposed repeater chain to help coordinate the project and to obtain commitments to set up the various repeater sites required. As a result of the trip seven within two metre range of each other were identified and committments were obtained for the establishment of six of them. The seven sites going from west to east are:

1. Erin Mills, Ontario (between Toronto and Hamilton)
2. Bowmanville, Ontario (East of Toronto)
3. Newark, New York (East of Rochester)
4. Syracuse, New York
5. Ilion, New York (Utica-Rome area)
6. Schenectady, New York
7. Hudson, New York

If the project succeeds, packet stations as far apart as Hamilton, Ontario and New York city should be able to communicate using these 7 repeaters. At the present time, however, no committment from any group in Syracuse, New York has been obtained. This means that an important element in the chain is still missing. If anyone is interested in setting up this 'missing link' in Syracuse please write to John Vandenberg at the address of the H.A.P.N. The group in Toronto will do all they can to assist in the establishment of the digital repeater in the Syracuse area.

The following are the names and addresses of individuals associated with the establishment of repeaters at the various sites:

Site #1
Bruce Cowan, VE3GBC, 165 La Rose Ave., Apt. 906, Weston, Ont.
Site #2
John Vandenberg, VE3DVV, R.R. 2, Mount Hope, Ont. L0R 1W0
Site #3
Ray Williams, WA2RYT, 305 Barry Road, Rochester, N.Y. 14617
Tom VanBuskirk, NA2D, R.D. 1, Phelps, N.Y. 14532
Site #4
Nobody!
Site #5
Angelo Tsiatsos, WB2NSU, 2 Vosburg Street, Ilion, N.Y. 13357
Vince Staffo, WB2FYZ, 10 Monroe Street, Ilion, N.Y. 13357
Site #6
Bill Patmos, W2DHT, 1054 Maryland Avenue, Schenectady, N.Y.
Howard Lester, W2ODC, P.O. Box 6, Alplaus, N.Y. 12008
Gil Porter, W1GP, 1322 Stratford Rd., Schenectady, N.Y. 12308
7. Site #7
Julius Madey, R.D. 2 Box 390, Hillsdale, N.Y. 12529
Jim Hendricks, RFD #1, Stuyvesant, N.Y. 12173

To my knowledge this is the first time such a digital repeater link-up has been attempted and it will take a while before we can get it going. Software to make the repeaters work together has to be developed and debugged. The major problem we have however, is poor communication between the various groups involved. They are separated geographically and are not all within two metre range of each other. We may have to use the 40 metre or 75 metre bands to communicate and coordinate this very ambitious project.

I will provide another progress report in a subsequent newsletter.

## CALIFORNIA ACTIVITY

HEY GANG,
How's this for an active area. Not note the checkin times.
A dump of the user list from UUT's BB.

L

| Call, Name | Mail | Last Access |
|---|---|---|
| KA6AIO, DAVE | | 10/21/83 8:55 AM |
| WD6AWP, Tim | <mail> | 10/22/83 5:59 PM |
| WA5BNH, Leon | | 10/22/83 7:08 PM |
| WA6CFM, rich | | 10/22/83 10:11 PM |
| WB5EKU, Don | | 10/22/83 10:01 AM |
| WD6FPY, BILL | | 10/22/83 3:14 PM |
| WB6HHV, Mike | <mail> | 10/21/83 12:40 AM |
| NK6K, Harold | <mail> | 10/22/83 10:23 PM |
| WA6OZJ, JIM | | 10/22/83 8:28 PM |
| NG6P, Roger | | 10/22/83 9:02 PM |
| WA6QDV, Bret | <mail> | 10/15/83 1:30 PM |
| N6TE, Harry | <mail> | 10/22/83 6:48 PM |
| WA6TUB, Steven | | 10/22/83 9:35 AM |
| WB6UUT, Lynn | | 10/22/83 6:05 PM |
| WB6YMH, Skip | | 10/22/83 7:19 PM |
| WA6ZMR, JIM | <mail> | 10/9/83 8:45 PM |

| Net | Subject | Last Entry |
|---|---|---|
| ALL | Of interest to all users | 10/20/83 11:45 PM |
| ARRL | W1AW bulletins | 10/17/83 1:39 AM |
| LINKS | Linking information | 9/21/83 2:12 AM |
| OSCAR | Information on AMSAT/Oscar | 10/15/83 12:20 AM |
| PROTO | Protocol Discussion/Forum | 10/7/83 1:32 PM |
| SWAP | Gear Wanted/For Sale | 10/17/83 2:08 AM |
| TAPR | To be forwarded to TAPR | 9/21/83 2:12 AM |

Commands: H)elp, L)ist users, S)end, R)ead, B)rowse, C)all SysOp
Command: :load off

---

This is a packet only BB, on 145.36. 7 of the above uers are LA based, the rest are SD.

Harold. (HAROLD PRICE, NK6K)

# GROUNDSTATION USERS' GUIDE
# FOR
# PACKET RADIO
# ON
# AMSAT-OSCAR 10

First Edition
Revision 1.00

September 16th, 1983

Compiled by the
HANK MAGNUSKI, KA6M
Region 2 Coordinator
Digital Special Service Channel

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Menlo Park, CA 94025
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# AMICON GROUNDSTATION USERS' GUIDE

## INTRODUCTION TO THE AMICON NETWORK

Within hours of the opening of the AMSAT Oscar 10 (Phase III-B) transponder, packet radio enthusiasts began testing their ability to send digital data through the newest of the amateur satellites. The first reports came in from Ian Ashley, ZL1AOX, and were soon followed by tests and two-ways between stations in Maryland, California, New Jersey, and elsewhere. The initial results were encouraging, and performance continues to improve as stations tweak their equipment and techniques.

This document is designed to be a guide to help users of the digital Special Service Channel and to assist newcomers in planning their equipment and operations. The origins of this document come from a message the author sent out in May of 1988 asking for information on stations interested in participating in AMICON.

This will briefly summarize the hardware and software required to transmit digital information through AO-10. It is still very early in the game, and much experimentation has yet to take place. Nobody has all the answers, and the reader will certainly not find them all here. A companion document, the AMICON Specification, is currently being revised and will be made available as soon as the editing is done and as soon as a little more operational experience accumulates.

The author will be very pleased to receive corrections, updates, and any other additional information which may be relevant to coordinating North American use of the digital SSC.

RF HARDWARE

Signal-to-noise ratio is the critical parameter for getting digital data through reliably. So a good groundstation will have lots of attention put into making sure that the "ears" are in top-notch condition. This means mast-mounted pre-amps, Gasfets if possible, and short cable runs. Antennas must be right-hand circularly polarized and pointed accurately. The general beacon should be heard at a level of 15dB above the noise or better.

Transmitter output seems to be less of a problem, and should be adjusted to be received at a level slightly above that of the general beacon.

PACKET HARDWARE

Both Vancouver TNCs and TAPR TNCs may be used as packet controllers. The TAPR TNC currently has more flexibility in adjusting parameters such as packet lengths and delay times.

Most experiments have been conducted using standard 202 type modems, running at 600 or 1200 Baud, into an SSB transmitter. This technique works, but produces just marginally acceptable results, with reports of 80% to 95% copy. Users should not attempt AFSK-FM type transmissions. The bandwidth is too large and calculations show that the results would be worse than marginally bad.

Some AMICON groundstations have telemetry type PSK modems available, and others are planning experiments with new PSK and MSK designs.

It seems clear that at the moment, the design and availability of a good modem is the critical factor to the success of the AMICON channel.

PACKET SOFTWARE

Both the TAPR and Vancouver TNCs have implementations of the protocol agreed to at the AMSAT general meeting in October of 1982. This protocol is documented in the Proceedings of the Second ARRL Computer Networking Conference. The software for the VADCG TNC (LIPM/TIPM 5.1) is available through the AMSAT Software Exchange.

Stations have found that sending short packets tends to produce better results, a direction which is opposite the conclusion of theoretical studies which show that you get eaten alive by overhead with short packets, and the larger packets you have, the better. Clearly this is related to the signal-to- noise and modem issue, and more work and careful testing needs to be done.

This is an exciting frontier in personal communications and personal computer networking. You are invited to make a contribution!.

PASSBAND FREQUENCIES

While AO-10 was still on the ground the DL group measured the frequencies to be:

| TEMP. | 0 deg. C | +25 deg. C | +35 deg. C |
|---|---|---|---|
| Eng. Beacon = | 145.988 MHz | 145.987 MHz | 145.986 MHz |
| Gen. Beacon = | 145.8105MHz | 145.810 MHz | 145.8091MHz |
| Downlink freq | 145.906 MHz | 145.903 MHz | 145.900 MHz |

(ref. = 435.1 MHz uplink)

Some time was spent measuring the passband limits and the following are the zero doppler frequency relationships. Please note that although the upper SSCs seem to fit OK with the originally published frequencies, the recommended L1 and L2 SSCs will have to be corrected to reflect the actual measurements.

# SLAPA BOARD II USER'S MANUAL

## Logging on:

Simply connect to the station running the bulletin board in converse mode (in our case KA9AKM). If you are a current user, you will be automatically recognized. The News headline will be displayed, and you will be notified if you have any current mail. If you do have mail, you may read your mail with the Read command.

## Giving Commands:

Commands may be given by just entering the first letter of the command followed by a return. Please be warned that in some circumstances, the bulletin board may be hung up if you try to send commands while text is comming from the system. These commands are given at the system prompt that begins with the text 'Cmd:'.

## Menu:

Entering the command '?' will display the list of commands with a short description.

## Receiving Mail:

Entering the command 'R' will display all current messages addressed to you. If you have no current mail, a message will be displayed telling you so.

## Browsing Mail:

The command 'B' will allow you to browse through the messages on the system. After choosing to Browse, you will be asked the following questions to narrow down the type of messages you will browse:

To:

Enter the call or Net identifier that you would like to have searched for in the 'To' portion of the message header.

From:

Enter the call or Net identifier that you would like to have searched for in the 'From' portion of the message header. Entering <return> for either the 'To' or 'From' prompts will search for any entry in that portion of the message header.

Current, All, or serial number:

Here you put in the starting position for the search through the messages. Entering All will start the search at the first message in the system. Entering Current will start the search at the first message that has been entered since you last Browsed. If you enter a serial number, the search will start with that serial number. Following your answer to this prompt with a 'T' will diplay not only the headers of those messages defined by the 'To' and 'From' questions, but will also display the body of the messages at the same time.

After the headers have been displayed you will be asked what number message you wish to read. Just enter the serial number, and the message will be send. If you then enter '+' at the same prompt the next time, the system will send the message with the next serial number.

## Sending Mail:

Selecting the Send command will let you send mail to another station or Net. You will first be asked to enter the call or Net identifier to which you wish to send the message. Then you can send the message. While entering mail, you may use the following commands:

'***abort' will cancel the message and return you to the command line.

'***restart' will start the message over and destroy any previous text.

'***edit' will allow you to reenter the last line and then continue.

'***end' will terminate and save the message.

(All these commands MUST be entered on a SEPARATE line and be followed by a <return>.)

Disconnecting will cause the message you are sending to be discarded, preventing partial messages from being posted. Messages are limited to 50 lines of text, with a warning around the 40th line.

You cannot send mail to station which have never accessed the mailbox, nor to a Net that has not been set up by the system operator.

## Clearing your Mail:

Messages will be retained as long as possible, and will be deleted automatically when space is needed for new users and/or messages.

## Listing the Users:

The List users command will display a list of the users and current Nets. The order is alphabetical by call suffix. The date and time of last access and a 'flag' indicating waiting messages is also displayed.

## Activity list:

The Activity command will display the last 10 entries in the system log. This will let you know who has been active lately.

## Calling System Operator:

Using the Call operator command will generate a beep alerting the system operator (SysOp) that you wish to talk to him. You should continue to use the mailbox as normal. If the SysOp is available, he will be able to break in after you complete a command. This is to prevent accidently interrupting you while you are in the process of completing a command.

## Logging Off:

Just disconnect. You will be logged off automatically. You will be entered into the log, and a message will be sent out allerting other users that the mailbox is now available.

## Nets:

A Net, as far as the mailbox is concerned, is an address which is not a call sign, to which messages may be sent. These allow special interest groups to distribute information to those who are interested. Nets may only be established by the SysOp. If you would like to establilsh a net, post a message to the SysOp, and he will do so.

## Command Chaining:

At any prompt other than the ':' prompt of the send mail command, you may chain a set of commands together by separating them with a semi-colon. For example, to Browse all current mail, the command 'B;;;C' could be given at the main command line. Chaining commands will avoid the sending of the prompts for later commands. Be careful how you use this feature, if you forget about one of the system prompts, you may have some of your commands going to the wrong prompt lines.

## Miscellaneous:

If you can't connect to the mailbox, it is probably in use. A disconnected packet (MAILBX packet) will be sent when the mailbox is again available.

If you do not get the normal 'Log on' message, you may need to disconnect and reconnect. If that does not work, the mailbox is probably off-line.

The Menu, Activity list, and the ***abort, ***restart, and ***edit commands of Send mail are not available on Lynn Taylor's standard Mailbox program. The News feature is not documented here because it has not been used very much at all, and will be removed from future versions of the Mailbox.

Other changes will be made known to you on APR BOARD 11 as usual. 73 de KA9AKM

| UPLINK FREQ. | DOWNLINK FREQ. | REMARKS |
|---|---|---|
| | - 145.987+MHz | Eng.Beacon (PSK) |
| 435.027 MHz | - 145.977 MHz | -3 DB point |
| 435.028 MHz | - 145.976 MHz | -1 DB point |
| 435.032 MHz | - 145.972 MHz | H1 Special Service Ch |
| 435.042 MHz | - 145.962 MHz | H2 SSC |
| 435.047 MHz | - 145.957 MHz | AMSAT Net & Calling F |
| 435.103 MHz | - 145.901 MHz | Center of up, downlink |
| 435.164 MHz | - 145.840 MHz | proposed new L2 SSC F |
| 435.174 MHz | - 145.830 MHz | proposed new L1 SSC F |
| 435.178 MHz | - 145.826 MHz | -1 DB point |
| 435.179 MHz | - 145.825 MHz | -3 DB point |
| | 145.810 MHz | General Beacon |

The bandwidth between the 1 DB points seems to match the 150 KHz figure which was measured on the ground. Also, the uplink / downlink frequency relationships seem to agree with earlier figures.

AMICON FREQUENCY

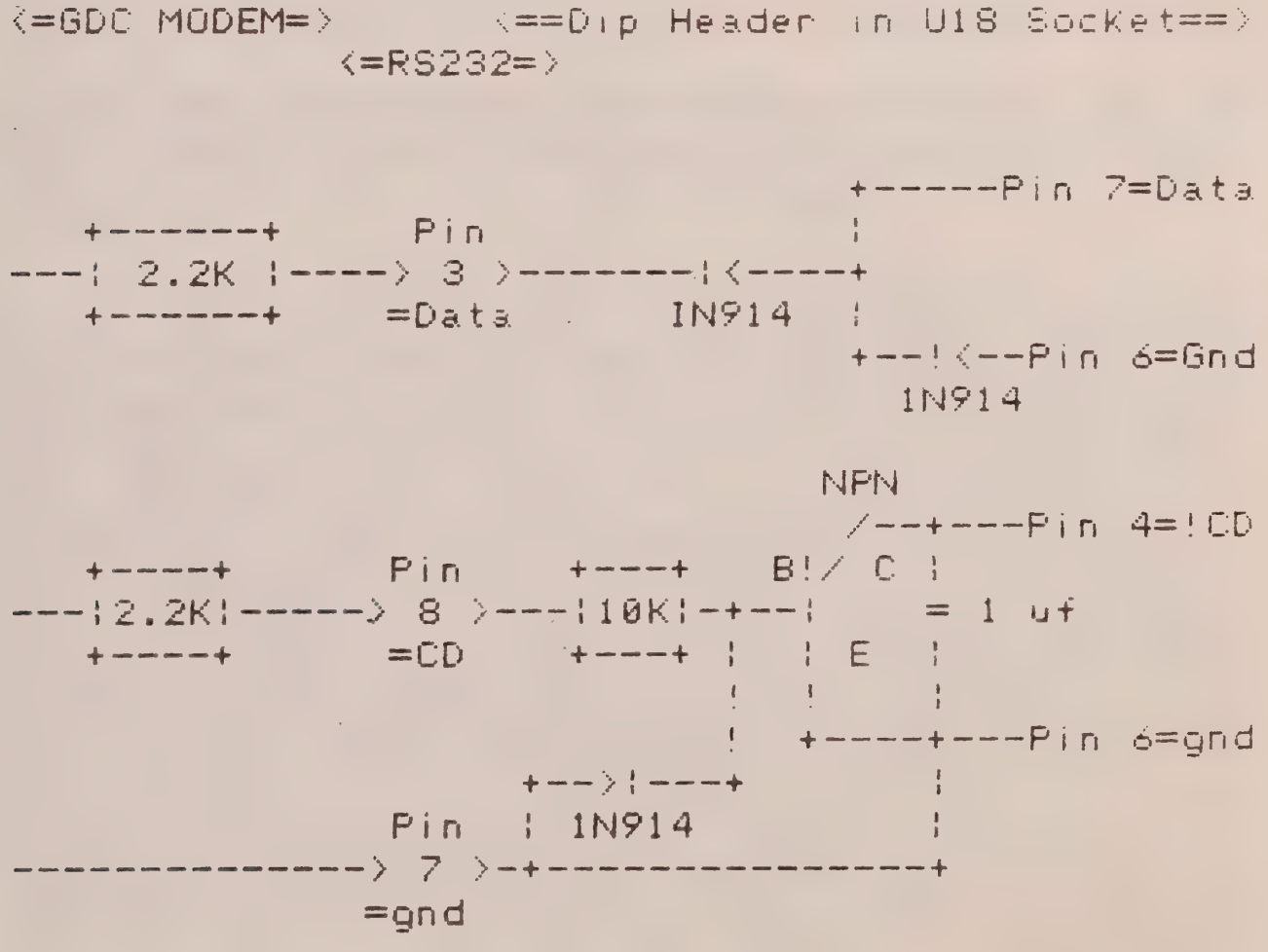
PACKET started at 145.830 on downlink (SSB definition) but moved up to about .835 to get away from passband droop.

There is a need for the AMICON SSC frequency to be better defined. Now that a number of tests have been made down on the low end of the A-O-10 downlink passband are there any firm recommendations as to what the best frequency would be for these transmissions? It seems that 145.830 MHz presents some problems being so close to the band edge. Is it a problem of phase distortion or attenuation? In either case, if a frequency 5 KHz higher than the original one turns out to be a better choice, then serious consideration should be given to moving AMICON back to the L2 SSC and making L1 the CW/RTTY bulletin channel used by W1AW, GB2RS, LU4ENQ and other future bulletin stations. Then AMICON would move to a downlink frequency of 145.840 MHz (L2) and W1AW & company would move to 145.830 MHz (L1).

On the topic of frequencies, it appears that it might be better to define an SSC as a measured frequency (say at apogee) instead of referencing it to a beacon. On the H1 & H2 SSCs most of the time the Engineering beacon isn't even on and at the low end of the passband the PSK transmissions on the GB don't allow for easy measurement of a reference frequency.

## CONNECTING A 202 MODEM TO THE TAPR TNC

Very good luck has been experienced by replacing the XR2211 demod chip in U18 on the TAPR TNC with an external 202 modem. The external modem seems to produce much better copy in the presence of noise (like thru AO-10 satellite). The external modem used is one of the General DataCom model 202-5B units that WA2LQQ found available in NJ/NY area about a year ago. Here is the documentation of the interconnecting circuitry.



The idea is to use diode clamps to convert data from RE232 to TTL, remembering that both pins 4 and 7 are pulled up to +5v on the TAPR TNC. The polarity of the data line is irrelevant since HDLC uses NRZI encoding. The Carrier Detect line must be inverted, so any old NPN transistor (e.g. 3N2222) can be used. The 1 uf cap across the !CD line prevents noise-induced interrupts and was found necessary to keep from fouling things up. The entire assembly (3 diodes, 1 transistor, 1 resistor and 1 capacitor) was assembled on a 14 pin DIP header that replaces U18, but you may want to be more elegant and pit it in a box. The two pin 6=GND lines are obviously tied together, but the computer grafix would have been messy to show this. The GDC moden had 2.2K resistors on its outputs -- they are shown above for completeness.

## DUPLEX OPERATION WITH THE TAPR TNC

There is something that has always been in the TAPR TNC code but which hasn't had a good use up to now. The high order trace bit ($4000) has a special meaning. This tells the TNC it is running full duplex and each frame is ACKED separately. This will maximise thruput if two TNC's are connected with different downlink frequencies. When MAXF is set so that there is more than one frame in flight, then the sender can send forever, since he sends frame n+1 at the same time that frame n is being acked. Obviously, this can not be used on a frequency that is being shared, since the TNC will never give up the frequency as long as any frame in the range N to N+MAXF-1 has been acked.

To get the most out of this, the watchdog timer on the TNC must be disabled. Now keydown times of longer than 15 seconds are possible. It is not recommended that this mode be for standard use, but it is interesting to experiment with. Try connecting to yourself and transmitting a small file. To enter this mode use the following command: TRACE $4000

DIRECTORY OF AMICON GROUNDSTATIONS

| | | | |
|---|---|---|---|
| VE3MWM | G. STEWART BEAL<br>BURLINGTON, ONT | VE7ADE | JOHN SPRAGGS<br>VANCOUVER, B.C. |
| W1HDX | JOHN DUBOIS<br>BOXBOROUGH, MA | K1HTV | RICHARD ZWIRKO<br>GLENDALE, MD |
| KA1M | ANDREW DESKUR<br>METHUEN. MA | W2IKI | ED SCHRUM<br>RED BANK, NJ |
| WA2LQQ | VERN RIPPORTELLA<br>WARWICK, NY | W3IWI | TOM CLARK<br>CLARKSVILLE, MD |
| N6ECT | CURTIS SPANGLER<br>SAN FRANSCISCO, CA | W6HDO | CLIFF BUTTSCHARDT<br>MORRO BAY, CA |
| NK6K | HAROLD PRICE<br>REDONDO BEACH, CA | KA6M | HANK MAGNUSKI<br>MENLO PARK, CA |
| N6TE | HARRY BLUESTEIN<br>LA JOLLA, CA | W6WYQ | ED ENGLISH<br>S LUIS OBISBO,CA |
| WA6WZO | FRIED HEYN<br>COSTA MESA, CA | WA7GXD | LYLE JOHNSON<br>TUCSON, AZ |
| KA9Q/2 | PHIL KARN<br>BERKELEY HGTS, NJ | W9OFZ | GUS KUETHER<br>EDWARDSVILLE, IL |
| W9TD | GARY KAATZ<br>HOFFMAN ESTATES, IL | WD0ETZ | BILL REED<br>CAREOLLTON, TX |

EARLY A-O 10 USE

ZL1AOX says that he was the first self connect on AO-10, 10:50-11:38 UTC on August 16, 1983.

W3IWI reports, "Despite some problems here, this is the first (albeit VERY MARGINAL) 2-way packet radio QSO thru AO-10." August 21, 1983

Transmissions on L1 SSC frequency (145.830 down-link) are to use FSK (i.e. AFSK tones thru SSB XMITRS) following the Phase-3 standard (LSB up, USB down).

NEPRA PACKETEAR

October 1983

Newsletter of the New England Packet Radio Association

# A BUNCH OF FIRSTS FOR PACKET RADIO

Two NEPRA members, K1OJH and KQ1E, helped out with a public service job on Sept. 11. A day full of bicycle and foot races in Quincy brought the ham community a request from Civil Defense to observe the course and call in any situations that needed medical assistance. With a 13-mile course for the morning races, it took all the comm capability available, not only from hams, but also from CAP and the regular and auxiliary police. Most of these services fed into base stations in a communication trailer downtown. Packet radio's part of the job was to take all the ambulance requests arriving at the trailer, and send them to the auxiliary police dispatcher, who dispatched the ambulances on another police frequency, using a console in the police station basement.

Ham radio was unusually important on this job, because a lightning strike a week earlier had knocked out most of the communication equipment at police headquarters. The main dispatch console had only one UHF channel up and running by the time of the race, and the backup console in the basement had another UHF channel, this one used for ambulance dispatching. The wired intercom between the two was down. HT access from the comm trailer to the UHF repeater was inadequate, so the dispatching had to be done from the basement. There was insufficient space there for all the radio services to set up -- hence the trailer at the main aid station. The telephone there didn't work, so the only links were by ham radio.

The police and CD people who watched and used the packet link were extremely pleased. Its major virtue was that it delivered the requests to the dispatcher, already on paper, and without a second speaker distracting him from the dispatch channel. It was never necessary to try to give attention to two voice conversations at the same time, because the paper output of the packet link stored the incoming information until the dispatcher was ready to use it, while making its presence known without delay. There's nothing like it in ordinary police communications. The dispatcher asked to keep the printout at the end of the job. It's probably going to inspire a lot of discussion.

It was also a help at the communication center end. It let us handle outgoing high-priority traffic without adding a speaker there (there was already plenty of voice traffic), and it let us converse as much as we wanted to between the two points without obstructing other communication.

This was the first case we know about of packet radio being used in the field, being used on a public service job, and being used for actual emergency communication. There were quite a few ambulance calls during the day.

Most of the time the equipment worked fine. Since this was a field trial, we expected some failures, and the briefing paper included two varieties of voice channel for backup. We had to go to voice a few times, but mostly we used packet.

There were a couple of rough spots. The Model 43 teletype used to send messages from the trailer has about a half-second lag between hitting a key and printing the letter. This made it next to impossible to copy from earphones directly onto the keyboard, so we failed to eliminate intermediate note-taking. I had hoped to achieve that short-cut. A video terminal would probably improve message input a lot, especially when formal messages are being transferred from voice or CW to packet.

Also, the system sends line-by-line, so occasionally a line of traffic would come in while we were typing a line to go out, causing mixed printout. That wasn't too confusing on a dedicated two-station link, but it could be a problem if packet were used on a larger scale, with several field stations sending messages to the same headquarters. A protocol is needed that would allow messages transmitted in overlapping time periods to be separated on the printout page.

All three radio services involved -- ham, CAP, and police -- performed with outstanding efficiency. I listened to two reports come in simultaneously late in the day, when everybody was concentrated around a small course, and the ham and the CAP officer made the same report within 15 seconds of each other. We had a composite report from both stations typed in, and were about to send it, when the ham reported arrival of the ambulance. A police officer had also reported the same bike accident, but he made it on the ambulance dispatch frequency, and so got to the dispatcher a few seconds sooner. I think that was the one where the ambulance arrived 40 seconds after the accident. Obviously, a lot of people did a good job.

All the hams did a fine job of minimizing unnecessary transmitting. The plan included several simplex channels for extended conversation, but there was hardly any need for them. The Quincy street maps that CD handed out at the briefing undoubtedly helped greatly in minimizing the need for on-the-air directions.

The biggest problem of the day had nothing to do with communications: there was no CD decision-maker at the comm center. As a result, it wasn't possible to get a better plan for assigning hams to other spots along the sparsely covered course, when it was discovered that some had been assigned to sites already covered by regular police with their own HT's. Other kinds of responses to the unexpected were also bottlenecked by this deficiency. In the future, I won't hesitate to suggest that any group that calls ham radio in should plan to have some kind of operations director at the point where the reports come in.

AB1Z

# ROLL YOUR OWN

xerox 820 style
by Don Reaves, KC5JH
trasnmitted to CAREN'S WORLD
editor by packet radio

DON. ***ROLL YOUR OWN***

Roll Your Own

For the benefit of those who still prefer to practice the amateur's craft of homebrewing their own equipment, I present the following ideas and suggestions as an example of putting together a complete computer for low cash outlay, that can be assembled in phases and configured as desired. The end result of this project is a professional quality computer system, in fact equal to a system that once was sold for several thousands of dollars. Experimenters and long-time homebrewers know the magic feeling of turning on a piece of gear that they have put their sweat, blood, and accumulated knowledge into, and having that piece of gear perform like or better than commercial equivalents costing several orders of magnitude higher than their own.

What I have done, and you can duplicate, is to assemble a commercial grade XEROX 820 computer from surplus components. Although this system is not state of the art technology, it far surpasses in capability any system you could buy for the equivalent cash outlay you will make. This project is feasible because XEROX 820's were never a very popular system with the general public, partly because XEROX did little to promote it and partly because it was too expensive an alternative for the first time computer buyer compared to other less powerful systems available. However, the basic machine is a workhorse, solid as a rock, readily expandable, and well supported with commercial and public domain software. XEROX chose to sell their manufacturing inventory as surplus, and move on to manufacturing other models. Fortunately, their loss is your gain, and knowledgeable computer constructors have been rejoicing.

The bottom line of cost to build this system is a function of your ability to find a suitable enclosure for all the components of the system. It's a startling fact that the cost of enclosures, especially for disk drives, is a major expense item. Therefore, to keep costs down, plan on either building some kind of enclosure, or adapting some cast away electronic equipment enclosure to be the home of your new system.

The following components are essential, and representative prices are listed in the table below.

1. XEROX 820 computer board, available either tested or untested. The basic board provides a video generator, parallel keyboard input, a serial printer port, a serial communications port, a disk controller for 8 or 5.25 inch drives, 64K RAM, and a software monitor in ROM.

2. Video computer monitor, either composite or separate video. The original monitor used in the XEROX was a Motorola DS3000-200, and apparently used a horizontal frequency based on 50 rather than 60 cycles per second. I used a monitor salvaged from a discarded Ramada Inn Reservation Computer, and a few modifications to the XEROX on-board video generator were necessary to synch the horizontal frequency. This monitor also served as the housing for the main board and power supply.

3. ASCII 7 or 8 bit parallel keyboard. The XEROX expects ASCII encoded 7 bit data. I used a salvaged OEM style keyboard and encoder.

4. Power Supply for the XEROX and the keyboard. Approximate power requirements are +5 VDC at 3 amps, +12 VDC at .5 amps, and -12 VDC at .25 amps. Building a power supply is rather trivial if you use 3 terminal regulators as I did. Surplus commercial supplies offer a good alternative to building one. The major consideration is integrating it with an enclosure.

5. Disk drives, either 8 or 5.25 inch. Be advised the drives must be Shugart compatible. Drives are the most critical component of the system, and the most likely to cause trouble. My personal preference is Shugart 8 inch drives, model 800/801. I have had little trouble using used or reconditioned Shugart drives.

6. Power Supply for the disk drives. Requirements are +24 VDC at 1.5 amps, +5 VDC at 1 amp. Older Shugarts also require -5 to -15 VDC at .25 amps. These are the requirements for one drive. If you plan to use two drives (highly recommended) double the current requirements. Three terminal regulators will work here as well.

7. Since the XEROX was designed with the CP/M operating system in mind, and CP/M is a copyrighted product, you must buy a copy of it. The portion of CP/M that is hardware specific (CBIOS) is not copyrighted and is available surplus.

The advantage to building this system is that it can be done in phases. Items 1 through 4 can be assembled, tested and played with before obtaining the remaining items, spreading out the cost to put together the whole system. With just the monitor, keyboard and main board running, you can verify that memory is good, test all ports, check video and keyboard operation, and diddle with the monitor software.

Later, add disk drives, power for the drives, and the operating system. Your final purchase will probably be a printer, and you have several choices for printers. The experience you gain putting the system together will prepare you for adding just about any peripheral to the XEROX, including parallel printers, modems, serial printers, ham radio interfaces, etc.

Hard to find, incidental parts, although inexpensive, can dampen your spirits and kill enthusiasm on a construction project. Careful shopping is the key to solving this problem. Consider the power connector on the 820. It requires an odd-ball AMP connector that I nearly gave up ever finding locally because I didn't initially have the part number and had to find it by trial and error in a distributor's warehouse, searching through bin after bin of connectors for the one that would mate with the one on the board. I even considered removing the PC board connector and substituting hard wires. However, I found it, and was glad I didn't remove the connector. The part

number is AMP 350763-4 with 350550-1 pins (9 pins required). The approximate cost is $2.50 from Electro Enterprises, and probably higher at Carlton - Bates. You can avoid these problems by buying these cables and incidentals surplus. Now the part with cable already attached is available for $3.00. It's better to purchase the part than spend days trying to find it locally.

Here is an analysis of typical costs:

| phase 1: | | phase 2: | | phase 3: (options) | |
|---|---|---|---|---|---|
| 820 board | 175 | 8" drives(2) | 300 | printer | 400 |
| monitor | 50 | p. supply | 50 | modem | 75 |
| keyboard | 50 | CP/M | 100 | | |
| p.s./cable | 25 | CBIOS | 35 | | |
| total | 300 | total | 485 | total | 475 |

For approximately $785, we can assemble a complete system. For $400 more, add a printer such as the Epson MX-80, and you have a professional quality system capable of providing years of useful work and enjoyment. To some extent, a well stocked junk box will help defray costs of items like power supplies, line cords, etc.

Bill of Materials

| Item: | Cost: | Sources: |
|---|---|---|
| XEROX 820 board | $175<br>300 | Ferguson Engineering<br>Xerox Outlet |
| Motorola Monitor | 50 | Xerox Outlet |
| Keyboard | 25 | Xerox Outlet |
| Keyboard Case/Cable | 50 | Xerox Outlet |
| Shugart 450 (5.25 ") drives with case and cable | 400 | Xerox Outlet |
| 820 switching power supply | 75 | Xerox Outlet |
| 820 power cable | 3 | Xerox Outlet |
| Documentation and schematics | 15<br>5 | Ferguson Engineering<br>NUF Computer Co. Inc. |
| Complete Cable Set | 20 | NUF Computer Co. Inc. |
| CBIOS and ROM source | 35 | Ferguson Engineering |
| Shugart 800/801 8 inch drives | 100+ | Various Sources |

Rumor has it that some, if not all, 820 parts at the XEROX outlet are now half-priced. If so, what are you waiting for??

Sources:

XEROX Manufacturing Outlet
1341 W. Mockingbird
Dallas, TX 75247
(214) 960-3367

Documentation, boards, drives enclosures, cables, power supplies keyboards. MC and Visa only for mail orders.

FERGUSON ENGINEERING
P.O. BOX 300085
Arlington, TX 76010
(817) 640-0207

Documentation, boards, cables, enclosures, software. Visa/MC Checks/MOs/No CODs

NUF Computer Co., Inc.
99 Pennsylvania Ave.
Nexton, MA 02164
(614) 964-8041

Documentation, schematics, Cable sets. MC and Visa

AND MOST IMPORTANTLY, information on a continuing basis:

Subscribe to Micro Cornucopia. Order all the back issues. Micro C is a magazine for computer buffs dedicated to single board computers like the Xerox 820, Digital Research Big Board, and the KayPro portable. These three in particular are essentially the same design. Indispensable information in these, especially the back issues.

Micro Cornucopia
David Thompson, publisher
P.O. Box 223
Bend, Oregon 97709
(503) 382-8048

ONE MORE:

Go to a decent bookstore or news stand and buy a copy of Computer Shopper (THE Yellow sheets of computers). Full of bargains and ideas. Has ads from Ferguson and Xerox Outlet.

KC5JH

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"You have not done enough, you have never done enough, so long as it is possible that you have something of value to contribute."
- Dag Hammarskjöld,

he Ninth
'renton' Computer Festival

# TCF84

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10 AM TO 4 PM, SUNDAY

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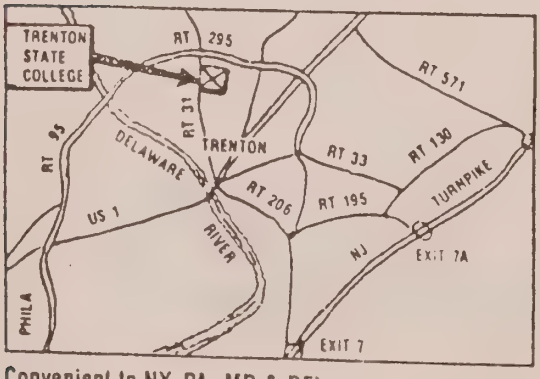
**Student Registration** — $3

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# NEWS RELEASE

NEWINGTON, CONNE

**RELEASE DATE:** IMMEDIATELY 10/21/83 **Telephone (203) 666-1541**

**SUBJECT:** Third ARRL Digital Communications Conference Call for Papers

**For more information, contact:** Paul L. Rinaldo, W4RI

The American Radio Relay League will hold its Third Amateur Radio Computer Networking Conference on April 15, 1984 in Trenton, NJ. The conference will be in cooperation with the 9th Trenton Computer Festival (TCF84) being held April 14-15, at Trenton State College.

The deadline for camera-ready papers is March 1, 1984. All papers should be mailed to Paul L. Rinaldo, W4RI, American Radio Relay League, 225 Main Street, Newington, CT 06111. If you plan to present a paper, please request an author's guide and identify the title of your paper immediately. Proceedings will be sold at the conference and by mail from ARRL Hq.

Technical papers are invited on all aspects of amateur packet radio, AMTOR, computer-based message systems, digital speech, presentation-level graphics and related Amateur Radio digital communications via terrestrial, ionospheric, meteor-scatter and satellite media including AMSAT-OSCAR 10 and PACSAT. Topics may include network and system architecture, proposed standards, hardware, software, protocols, modulation and encoding schemes, applications, and practical experience.

# AMATEUR RADIO
## *Monthly*
# Buy / Sell / Swap Meet

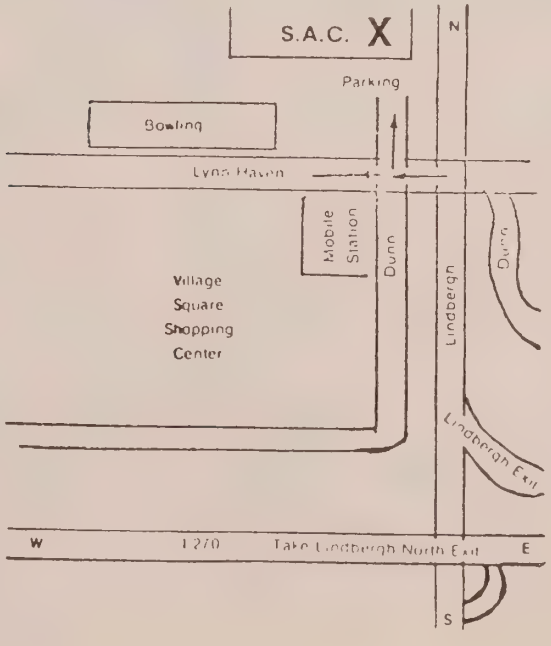
**SUNDAY**
**JAN. 22**
**12 noon-4 pm**

**Call 895-1272**
To Reserve A Table
Sellers Set Up Time 11:00

*Walk-In Sellers Accepted On A First Come First Served Basis*

Tables - $10^{00}$ Admission $1^{50}$

***Single Activities Center***
7215 N. Lindbergh Hazelwood, Mo.
(Formerly Elm Grove Elementry School)
1 Blk. North of I-270 at Lindbergh & Dunn Rd.




*Other Meets*

**Feb. 26**

*Other Meets*

**March 25**
**April 29**
**May 27**

# Computer/Stereo/VCR *Monthly*

# Buy / Sell / Swap Meet

Sony

Pioneer

VIC 20

Software

Atari

JVC

Sony

TRS 80

T.I.

Minolta

Hardware

Movies

Panasonic

**SUNDAY**

**JAN 8**

**12 noon-4 pm**

**Call 895-1272**

**To Reserve A Table**

Sellers Set Up Time 11:00

*Walk-In Sellers Accepted On A First Come First Served Basis*

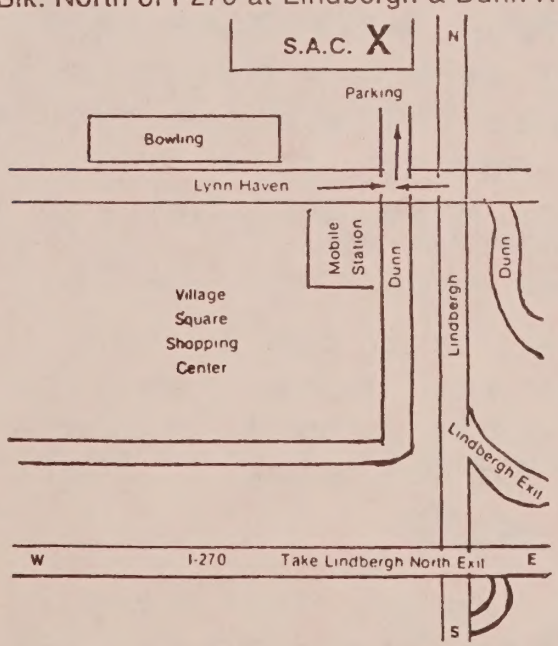
**Tables - $10.00** **Admission $1.50**

## *Single Activities Center*

7215 N. Lindbergh Hazelwood, Mo.

(Formerly Elm Grove Elementry School)

1 Blk. North of I-270 at Lindbergh & Dunn Rd.




*Other Meets*

**Jan. 8**
**Feb. 5**
**March 4**

*Other Meets*

**April 1**
**May 6**

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## FLAG

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identifies the beginning or the end of a packet

Well gang this is it, the last issue of SLAPR PROTOCOL. But don't despair, look at all we have accomplished! The whole idea behind our eforts was to spread the word about Packet Radio and digital communications. Considering that the circulation of our newsletter (around 100) and its readership include folks from around the country, and some places overseas we did pretty well. Notice the word "we", WE as a group did it but there are some folks I would like to recognize one last time:

Gus, W9OFZ, Editor and past secretary, what can I say that hasn't already been said. Gus' efforts and heart went into this publication. Without him we wouldn't have made it. Thanks Gus!

Bill, WD0ETZ (now "/5"), ol'wild Bill is in Texas now. As our first Vice President and developer of that neat Packet BBS he spent many a night and weekend working on making the whole thing GO. Take Care Bill!

Mel, K0PFX, Honestly I don't know when this guy has time to sleep. The TAPR EPROM programmer, and TNC cabinet were all Mel's doing. If you give Mel a job he does it, and the results are always FIRST CLASS. Add to this taking up were Bill left off as Vice President Mel was indespensable. Way to go Mel!

Ed, KA0AYO, A club can't run without someone taking care of the money and the books. Ed's being a CPA doesn't hurt either, we stayed in the black and Ed was always there when needed. Good Job Ed!

And of course to all the rest of you for your support and kind words and letters, it kept us going!

SLAPR, as a group, is not disappearing we are just regrouping as a much more locally oriented group. Our national prominence was gratifying but well beyond what our group was able to handle. TAPR is doing an excellent job on this front and we feel our efforts in supporting them would be much more beneficial.

SLAPR'S Officer structure is also changing. At the last meeting it was decided that the offices of President, Vice President, Secretary/Tresure would be dropped and instead a "Care Taker" would be selected to oversee SLAPR. We will still meet and have projects. Their development and follow-through will be his job. It will be ALL of our responsibility to make sure we help out when the need arises. Who volunteered for this exciting task you may ask, Ol' Spence, KA0IXI, came to our rescue and will be avalible to oversee our operations during the comming year. If you have any questions or comments, please don't hesitate to contact Spence at SLAPR'S new address:

St Louis Area Packet Radio (SLAPR)
c/o Spence Branham KA0IXI
9926 Lewis and Clark
St. Louis, MO 63136

Its been fun for all. It was an experiment worth doing, and the outcome was a huge success.

Take Care & 73

Pete

Pete WB9FLW

SLAPR PROTOCOL
ST. LOUIS AREA PACKET RADIO CLUB
9926 LEWIS AND CLARK
ST LOUIS, MO 63136

SAINT LOUIS, MO
PM
JAN 10
1984

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*                        *
*     YOUR LAST ISSUE    *
*           OF           *
*     SLAPR PROTOCOL     *
*                        *
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KA6M
HANK MAGNUSKI
311 STANFORD AVE

MENLO PARK, CA 94025

NEXT SLAPR MEETING
7:30 PM ON JANUARY 23, 1984
GRAND TETON ROOM, 7TH FLOOR
DEACONESS HOSPITAL
6150 OAKLAND, 40 AT HAMPTON
ACROSS FROM FOREST PARK
ST. LOUIS, MO